

Table 1
CD28 family superagonistic epitopes
Epitopes are named according to the strands from which they derive.

<i>Protein</i>	<i>A'</i>	<i>B</i>	<i>C-C'</i>	<i>C''-D</i>	<i>E</i>	<i>F</i>	<i>G</i>
hCD28	SPMLV	AVNLS	SLHKGLDSAVEVCV	VYSKTGFNCDG	FYLQN	TDIYFC	NGTIIHV
hCTLA-4	PAVVL	GIASFV	TVLRQADSQVTEVCA	FLDDSICTG	LTIQG	TGLYIC	NGTQIYV
hICOS	YEMFI (SEQ ID NOs:23, 24, 25)	GVQIL (SEQ ID NOs:26, 27, 28)	QLLKGGQILCD (SEQ ID NOs:29, 30, 31)	VSIKSLKFCBS (SEQ ID NOs:32, 33, 34)	FFLYN (SEQ ID NOs:35, 36, 37)	ANYYFC (SEQ ID NOs:38, 39, 40)	TGGYLHI (SEQ ID NOs:41, 42, 43)

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PD-1 and BTLA superagonistic epitopes

<i>Protein</i>	<i>A</i>	<i>B</i>	<i>C-C'</i>	<i>C''-D</i>	<i>E</i>	<i>F</i>	<i>G</i>
hPD-1	PALLVV	DNATF	RMSPSNQTDK	QPGQDCRFR	MSVVR	NDSGTY	LRAELR
hBTLA	QSEHSI (SEQ ID NOs:44, 45)	DPFEL (SEQ ID NOs:46, 47)	KLNG (SEQ ID NOs:48, 49)	QTSWK (SEQ ID NOs:50, 51)	LHFEP (SEQ ID NOs:52, 53)	NDNGSY (SEQ ID NOs:54, 55)	TTLYVT (SEQ ID NOs:56, 57)

Table 3

<i>Protein</i>	<i>Sequence</i>
hCD28	GNYSQQQLQVYSKTGF (SEQ ID NO:58)
hCTLA-4	YMMGNELTFLDDS (SEQ ID NO:59)
hICOS	KTKGSGNTVSIKSLK (SEQ ID NO:60)
hPD-1	LAAFPEDRSQPGQDCR (SEQ ID NO:61)

Table 5

DNA sequence of human CD28 cDNA (SEQ ID NO: 15)

agactctcag	gccttggcag	gtgcgtcttt	cagttcccct	cacacttcgg	gttcctcggg	60
gaggaggggc	tggaacccta	gcccatacgtc	aggacaaaga	tgctcaggct	gctcttggct	120
ctcaacttat	tcccttcaat	tcaagtaaca	ggaaacaaga	ttttgggtgaa	gcagtcgccc	180
atgcttgtag	cgtaacgacaa	tgcggtoaac	ccttagctgca	agtattccta	caatctcttc	240
tcaagggagt	tccgggcata	ccttcacaaa	ggactggata	gtgctgtgga	agtctgtgtt	300
gtatatggga	attactccca	gcagcttcag	gtttactcaa	aaacgggggt	caactgtgat	360
gggaaattgg	gcaatgaatc	agtgacattc	tacctccaga	atttgtatgt	taaccaaaca	420
gatatattact	tctgcaaaat	tgaagttatg	tatctctctc	cctacctaga	caatgagaag	480
agcaatggaa	ccattatcca	tgtgaaaggg	aaacaccttt	gtccaagtcc	cctatttccc	540
ggacottcta	agcccttttg	ggtgctgggt	gtggttgggt	gagtcctggc	ttgctatagc	600
ttgctagtaa	cagtggcctt	tattattttc	tgggtgagga	gtaagaggag	caggctcctg	660
cacagtgact	acatgaacat	gactccccgc	cgccccgggc	ccaccgcgaa	gcattaccag	720
ccctatgccc	caccacgcga	cttcgcagcc	tatcgctcct	gacacggacg	cctatccaga	780
agccagccgg	ctggcagccc	ccatctgctc	aatatcactg	ctctggatag	gaaatgaccg	840
ccatctccag	ccggccacct	cagccctgt	tgggccacca	atgccaat	ttctcgagt	900
actagaccaa	atatcaagat	catttttgaga	ctctgaaatg	aagtaaaaga	gatttcctgt	960
gacaggccaa	gtcttacagt	gccatggccc	acattccaac	ttaccatgta	cttagtgact	1020
tgactgagaa	gttagggtag	aaaacaaaaa	gggagtggat	tctgggagcc	tcttcccttt	1080
ctcactcacc	tgcacatctc	agtcaagcaa	agtgtgggat	ccacagacat	tttagttgca	1140
gaagaaaggc	taggaaatca	ttcctttttg	ttaaatgggt	gtttaatctt	ttggttagt	1200
ggttaaaccg	ggtaagttag	agtaggggga	gggataggaa	gacatattta	aaaaccatta	1260
aaacactgtc	tcccactcat	gaaatgagcc	acgtagtctc	tattttaatgc	tgttttcctt	1320
tagtttagaa	atacatagac	attgtctttt	atgaattctg	atcatattta	gtcattttga	1380
ccaaatgagg	gatttggtca	aatgagggat	tccctcaaag	caatatcagg	taaaccaagt	1440
tgctttcctc	actccctgtc	atgagacttc	agtgttaatg	ttcacaatat	actttcgaaa	1500
gaataaaata	gttc					1514

Amino acid sequence of human CD28 (SEQ ID NO:1)

MLRLLLALNL FPSIQVTGNK **ILVKQSPMLV** AYDNAVNLSC **KYSYNLFSRE** FRASLHKGLD
SAVEVCVVYG NYSQQLQVYS **KTGFNCDGKL** GNE SVTFYLQ NLYVNQTDIY **FCKIEVMYPP**
PYLDNEKSNG **TIHVKGKHL** CPSPLFPGPS KPFWVLVVVG GVLACYSLLV TVAFIIFWVR
SKRSRL LHSD YNMTPRRPG PTRKHYQPYA PPRDFAAYRS

The extracellular domain is shown in bold
The stalk region is underlined